



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,105	12/30/2005	Misao Takakusaki	1592-0159PUS1	4561
2292 7590 04/09/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
SONG, MATTHEW J				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
04/09/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/563,105

Applicant(s)

TAKAKUSAKI ET AL.

Examiner

MATTHEW J. SONG

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/86)
Paper No(s)/Mail Date 9/21/07: 12/30/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kashima et al (JP 07-086162), an English Abstract and Computer Translation (CT) are provided.

Kashima et al discloses a method of forming a heterostructure film comprising supplying a group IIIa and Va material to grow an IIIaVa thin film using gas source molecular beam epitaxy (Abstract, Fig 1, and CT [0005]-[0007]), this reads on a applicant's first step of irradiating a molecular beam of at least one group III element and a molecular beam of a first group V element to form a first compound semiconductor layer. Kashima et al also discloses supply to a substrate of a Va group material is suspended and t2 time discontinuation of the supply of all thin film raw materials to a substrate is carried out to terminate growth of the IIIaVa thin film (Abstract, Fig 1 and CT [0005]), this reads on applicant's second step of stopping the irradiation of the molecular beam of the group III element and the molecular beam of the first group V element to halt growth until an amount of the first group V element supplied is reduced to 1/10 or less of that in the first step because Kashima et al teaches a time period t2 where all raw materials are suspended which reads on reducing a supply of the first group V element to 0. Kashima et al also teaches supplying a Vb and IIIB material to grow a IIIBVb thin film after the

time period t2. (Abstract and [0005]). Kashima et al also teaches forming a heterostructure of InGaAs and InP (CT [0007] and Fig 2, 4 and 5), this reads on applicant's etch stopper layer on the first compound semiconductor layer where the etch stopper being composed of the second compound semiconductor layer which is different from the first compound semiconductor layer because Kashima et al teaches the same materials as applicant for the etch stopper layer (See instant claim 3).

Referring to claim 2, Kashima et al teaches the first step, the second step and the third step, as discussed previously.

Referring to claims 3 and 5, Kashima et al teaches a first compound semiconductor of InGaAs and a second layer of InP. (CT [0007] and Fig 4-5).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashima et al (JP 07-086162), an English Abstract and Computer Translation (CT) are provided, as applied to claims 1-3 and 5 above, and further in view of Watanabe (US 6,229,162).

Kashima et al teaches all of the limitations of claim 4, as discussed previously, except a first layer of InP or InGaP and a second layer of InAlAs or InGaAs. Kashima et al does teach forming a heterostructure with a first layer of InGaAs and a second layer of InP, thus the order of the first and second layer is the feature which is not explicitly taught.

In a method of forming a semiconductor device, note entire reference, Watanabe teaches forming a photodiode comprising an InP etching stop layer **16**, an InAlAs cap layer **17**, an InGaAs second etching stop layer **18**, an InP etching stop layer **19**, an InAlAs cap layer and a InGaAs contact layer **111** grown using gas source molecular beam epitaxy. (Abstract, col 8, ln 35-50 and Fig 1).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kashima et al by using a first layer of a InP **16** and a second layer of InAlAs **17** or InGaAs **18** as a second layer, as taught by Watanabe to produce a useful device.

Conclusion

Art Unit: 1792

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. SONG whose telephone number is (571)272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song
Examiner
Art Unit 1792

MJS
March 30, 2008

/Robert M Kunemund/
Primary Examiner, Art Unit 1792